

Code No: R204101B

R20

Set No. 1

IV B.Tech. I Semester Regular Examinations, January – 2024

BRIDGE ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 70

*Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks*

UNIT– I

- 1 a) Discuss the different types of RCC bridges giving the main features of each type. [7]
b) Discuss briefly on the types of foundations adopted for a bridge. [7]

(OR)

- 2 a) What are various components of a Bridge? Explain with a neat sketch. [7]
b) What is the role of well foundation in bridges? [7]

UNIT – II

- 3 a) Write a brief note on Wheel loads to be considered in design of Slab bridges. [7]
b) Explain the Use of Pigeaud's charts for computation of moments in charts. [7]

(OR)

- 4 a) Explain Hendry-Jaeger Method for analysis of bridges. [7]
b) Write a brief note on effective width method adopted for Slab bridges. [7]

UNIT – III

- 5 Design longitudinal girders of an RCC T-beam girder bridge for the following data.

Clear width of road way = 7.5m,

Span (c/c of bearings) = 20m,

Width of supports = 400mm,

Width of kerbs = 600mm,

Wearing coat = 80mm thick,

Loading = IRC Class AA,

M30 concrete and Fe500 steel are to be adopted.

[14]

(OR)

- 6 a) Discuss on the various elements present in a T beam bridge. [7]
b) Explain Various longitudinal forces acting on a T beam Bridge. [7]

UNIT – IV

- 7 Design the cross-section of a deck type welded Plate girder bridge for the following data.
Design the for the following data
Effective span = 25m,
Dead load = 7kN/m,
Equalent total live load for bending moment calc. / track = 2727kN,
Equalent total live load for shear calc. / track = 2927kN,
Width of abutment = 4m,
Top of rail level = 108m,
Side slopes of embankment = 1.5:1,
Foundation level = 100m,
(Note: Design of connections, bracings and stiffeners not required) [14]

(OR)

- 8 a) Discuss on the various components of a plate girder using a sketch. [7]
b) Explain the function of lateral bracings and cross frames used in plate girder bridges. How do you design them in a typical plate girder? [7]

UNIT – V

- 9 a) Elaborately explain the importance of bridge bearings in the overall performance of a bridge. [7]
b) Enumerate the different types of inspections carried out on bridges and their respective purposes. [7]

(OR)

- 10 A Reinforced Concrete box culvert having a clear ventway of $3\text{m} \times 3\text{m}$. The superimposed dead load on the culvert is 12.8kN/m^2 , the live load on the culvert is 50kN/m^2 , Density of soil at site is 18kN/m^3 , Angle of repose = 30° . Determine

- Total uniformly distributed load on the box culvert
- Soil pressure
- Uniform lateral pressure due to dead load and live load
- Uniform lateral pressure due to dead load surcharge
- Intensity of water pressure.

[14]